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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,905	01/31/2005	Harry Richard Claringburn	P/62303	1397

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EXAMINER	
LIU, LI	

ART UNIT	PAPER NUMBER
2613	

NOTIFICATION DATE	DELIVERY MODE
02/04/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/500,905	Applicant(s) CLARINGBURN ET AL.	
	Examiner LI LIU	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 14 December 2009.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 9,10,12,13,15 and 16 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 9,10,12,13,15 and 16 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 02 July 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/14/2009 has been entered.

Response to Arguments

2. Applicant's arguments filed on 12/14/2009 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 9, 10, 12, 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caroli et al (US 2003/0002104) in view of Shimomura et al (US 6,400,498) and Corio (US 5,436,921).

1). With regard to claims 9 and 12, Caroli discloses a dense wavelength division multiplexing (DWDM) optical communications network having a plurality of nodes (Figures 1 and 4, the ADD/DROP nodes) for an n-channel dense wavelength division multiplexing (DWDM) optical network (Figures 1 and 4, N channels are added or dropped), each node comprising: an add path (e.g., 431 in Figure 4) for adding an n-channel wavelength multiplex onto the network, some of the n-channels carrying signals to be added onto the network (e.g., Figure 4, some of the N channels are added, [0048]), the add path including an n signal channel combiner (e.g., MUX 435, 436 and combiner 437 in Figure 4) for combining the n-channel signals, an optical amplifier (e.g., the amplifier 438 in Figure 4) for amplifying an output of the signal combiner, a multichannel wavelength selective filter (e.g., the wavelength blocker/dynamic gain equalization function: λ-BLOCKER/DGEF 440 in Figure 4) with variable-per-channel attenuation (DGEF in the wavelength blockers, the DGEF provides a per-channel gain equalization capability, [0048]) for blocking channels not carrying signals to be added to the network ([0048], the wavelength blocker 440 is configured to block those wavelengths corresponding to optical channels not being added at node 415 while passing the wavelengths of those optical channels being added at node 415. That is, for “those optical channels not being added at node 415”, the corresponding channels or signal paths in the λ-BLOCKER/DGEF do not carry any signals, except noise. Then, those channels are blocked in the channel/signal path of the blocker/DGEF to be added to the network. Also refer to [0026], "because only one or more (but probably less than N) optical channels are <u>actually carrying communication traffic</u> to be added to the WDM

signal, the WDM signal output by optical multiplexer 235 is coupled to wavelength blocker 240 which would operate similarly to wavelength blocker 225 as previously described. That is, wavelength blocker 240 would selectively pass or block individual optical channels such that only those optical channels that are actually to be added at add/drop node 115 would be allowed to pass via "add" path 231 to combiner 230. All other "unused" optical channels carried in add path 231 would be blocked by wavelength blocker 240 in order to prevent signal collisions with optical channels having the same wavelengths in "through" path 226. Accordingly, all optical channels being dropped or added at add/drop node 115 would be blocked by the respective wavelength blocker 225 and 240 in this illustrative embodiment". That is, the λ-BLOCKER/DGEF for blocking channels not carrying signals/traffic to be added to the network) and controlling an amplitude of the added signals ([0048], DGEF provides a per-channel gain equalization capability so that the power of the optical channels being added can be maintained at a level approximately equal to the average of the power of the optical channels in "through" path 426), and an add coupler for coupling the add path to the network (e.g., the combiner 430 in Figure 4).

Caroli et al teaches "Wavelength blocker 440 provides an added benefit by <u>minimizing</u> amplified spontaneous emission (ASE) noise that may be generated by optical amplifier 438"; that is, the λ-BLOCKER/DGEF provides filtering function. But, Caroli et al does not expressly state the multichannel wavelength selective filter for filtering around the channels, and the node further comprising means for running sources for generating the n-channel signals at maximum power.

With regard to “filtering around the channels”, Caroli et al teaches that the λ-BLOCKER/DGEF wavelength blockers can block some specific wavelengths and pass other wavelengths and incorporate a dynamic gain equalization function (DGEF) to provide a per-channel gain equalization capability so that the power of the optical channels being added can be maintained at a level approximately equal to the average of the power of the optical channels in "through" path ([0048]). Therefore, it is obvious that an n-channel demultiplexer and an n-channel multiplexer is present in the wavelength blockers and the attenuator/DGEF must be arranged between each of the demultiplexer outputs and multiplexer inputs so that the multiplexed signal can be demultiplexed and the individual channel can be dynamically controlled (per-channel) by the DGEF (also refer to [0024], Caroli et al states that a planar lightwave wavelength blocker etc can used as the wavelength blocker, the planar lightwave wavelength blocker has demultiplexer and multiplexer).

It is commonly known that the wavelength multiplexer/demutiplexer has predetermined pass-band; and the pass-band is for specific wavelength, and then, other wavelength components/noise around the pass-band is reduced/filtered. Another prior art, Shimomura et al, in the same field of endeavor, teaches a multichannel wavelength selective filter (e.g., Figure 23) with variable-per-channel attenuation (optical attenuators in Figure 23) for controlling an amplitude of signal channels (column 20 line 39-51) the optical level of the respective wavelength lights in the wavelength-multiplexed optical signal can be adjusted into an arbitrary level by the optical attenuators) and for filtering around the channels (column 20 line 32-37, the optical demultiplexer 120 removes an

ASE noise from the optical amplifier of a previous-stage optical signal repeating and amplifying device or optical level adjusting device, and it further removes an optical signal with a wavelength other than the signal channel wavelengths).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Shimomura et al with the system of Caroli et al so that the undesired frequency components and noise are removed/filtered, and the quality of the signal channel is improved.

With regard to “running sources for generating the n-channel signals at maximum power”, however, Corio teaches a power control system and method (e.g., Figure 2), wherein the running source (e.g., the Laser Diode 12) generates the light signal at maximum power (column 2 line 22-23, and column 5 line 35-36, and column 6 line 28-29), and then an attenuator (e.g., 18 in Figure 2) is used to control the power output from the attenuator to a desired level.

Caroli et al teaches that the wavelength blocker with variable-per-channel attenuation (DGEF) blocks channels not carrying signals to be added to the network and controlling an amplitude of the added signals, and minimizing amplified spontaneous emission ASE noise, and then the signal to noise ratio is increased. If the sources are running below a predetermined level, the DGEF or attenuator would not participate in the controlling, and the desired power level may not be obtained. Corio teaches that by setting the laser at maximum power, the variable attenuator can accurately (fine tune) control/adjust the power level that can be inputted into the fiber. According to the teaching/suggestion of Corio and it is also obvious that if the light

source is run at <u>minimum</u> power, a desired power may not be obtained by the VOA since the VOA functions as an attenuating not amplifying, or the VOA may not fully participate in controlling the power: suppose the laser power can be set between -1 dBm to 5 dBm, while the laser is run at -1 dBm, the channel power that can be sent to the transmission line can only be adjusted to less than or equal to -1 dBm, and if the transmission line needs 2 dBm channel power, the laser/VOA cannot provide that desire power; however, while the laser is run at 5 dBm, the maximum channel power that can be sent to the transmission line can reach up to 5 dBm, by using the VOA, the channel power can be adjusted/tuned to the desired power, e.g., 2 dBm. The combination of Caroli and Corio teaches that while the variable attenuator is used for control the power level of a light source, the power of the light source needs be running at maximum power so that the variable attenuator can be used to control the amplitude of the light signal to be added.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the power control scheme as taught by Corio to the system of Caroli et al and Shimomura et al so that the signal source is run at full power, and then gain equalizer/attenuator can perform the full function to conveniently and accurately control the output power to a desired level, and the desire SNR can be obtained.

2). With regard to claim 13, Caroli discloses a method of adding an n-channel dense wavelength division multiplexing (DWDM) signal to an n-channel DWDM optical network (Figures 1 and 4, N channels are added or dropped), comprising the steps of:

combining (e.g., MUX 435, 436 and combiner 437 in Figure 4) the signals from a plurality of signal sources (e.g., λ1 to λN in Figure 4) to provide an n-channel add signal combined output signal (the multiplexed signal from combiner 437); amplifying the combined output signal (the amplifier 438 in Figure 4); using a multichannel wavelength selective filter with variable-per-channel attenuation (e.g., the wavelength blocker/dynamic gain equalization function: λ-BLOCKER/DGEF 440 in Figure 4; the DGEF in the wavelength blockers provides a per-channel gain equalization capability, [0048]) to selectively block channels not carrying any signals to be added to the network ([0048], the wavelength blocker 440 is configured to block those wavelengths corresponding to optical channels not being added at node 415 while passing the wavelengths of those optical channels being added at node 415. That is, for "those optical channels not being added at node 415", the corresponding channels or signal paths in the λ-BLOCKER/DGEF do not carry any signals, except noise. Then, those channels are blocked in the channel/signal path of the blocker/DGEF to be added to the network. Also refer to [0026], "because only one or more (but probably less than N) optical channels are <u>actually carrying communication traffic</u> to be added to the WDM signal, the WDM signal output by optical multiplexer 235 is coupled to wavelength blocker 240 which would operate similarly to wavelength blocker 225 as previously described. That is, wavelength blocker 240 would selectively pass or block individual optical channels such that only those optical channels that are actually to be added at add/drop node 115 would be allowed to pass via "add" path 231 to combiner 230. All other "unused" optical channels carried in add path 231 would be blocked by

wavelength blocker 240 in order to prevent signal collisions with optical channels having the same wavelengths in "through" path 226. Accordingly, all optical channels being dropped or added at add/drop node 115 would be blocked by the respective wavelength blocker 225 and 240 in this illustrative embodiment". That is, the λ-BLOCKER/DGEF for blocking channels not carrying signals/traffic to be added to the network) and to control an amplitude of the added signals ([0048], DGEF provides a per-channel gain equalization capability so that the power of the optical channels being added can be maintained at a level approximately equal to the average of the power of the optical channels in "through" path 426); coupling the n-channel add signal onto the optical network (e.g., the combiner 430 in Figure 4 couples the N-channel add signal onto the optical network).

Caroli et al teaches "Wavelength blocker 440 provides an added benefit by minimizing amplified spontaneous emission (ASE) noise that may be generated by optical amplifier 438"; that is, the λ-BLOCKER/DGEF provides filtering function. But, Caroli et al does not expressly state the multichannel wavelength selective filter for filtering around the channels, and the node further comprising means for running sources for generating the n-channel signals at maximum power.

With regard to "filtering around the channels", Caroli et al teaches that the λ-BLOCKER/DGEF wavelength blockers can block some specific wavelengths and pass other wavelengths and incorporate a dynamic gain equalization function (DGEF) to provide a per-channel gain equalization capability so that the power of the optical channels being added can be maintained at a level approximately equal to the average

of the power of the optical channels in "through" path ([0048]). Therefore, it is obvious that an n-channel demultiplexer and an n-channel multiplexer is present in the wavelength blockers and the attenuator/DGEF must be arranged between each of the demultiplexer outputs and multiplexer inputs so that the multiplexed signal can be demultiplexed and the individual channel can be dynamically controlled (per-channel) by the DGEF (also refer to [0024], Caroli et al states that a planar lightwave wavelength blocker etc can used as the wavelength blocker, the planar lightwave wavelength blocker has demultiplexer and multiplexer).

It is commonly known that the wavelength multiplexer/demutiplexer has predetermined pass-band; and the pass-band is for specific wavelength, and then, other wavelength components/noise around the pass-band is reduced/filtered. Another prior art, Shimomura et al, in the same field of endeavor, teaches a multichannel wavelength selective filter (e.g., Figure 23) with variable-per-channel attenuation (optical attenuators in Figure 23) for controlling an amplitude of signal channels (column 20 line 39-51, the optical level of the respective wavelength lights in the wavelength-multiplexed optical signal can be adjusted into an arbitrary level by the optical attenuators) and for filtering around the channels (column 20 line 32-37, the optical demultiplexer 120 removes an ASE noise from the optical amplifier of a previous-stage optical signal repeating and amplifying device or optical level adjusting device, and it further removes an optical signal with a wavelength other than the signal channel wavelengths).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Shimomura et al with the

system of Caroli et al so that the undesired frequency components and noise are removed/filtered, and the quality of the signal channel is improved.

With regard to “running sources for generating the n-channel signals at maximum power”, however, Corio teaches a power control system and method (e.g., Figure 2), wherein the running source (e.g., the Laser Diode 12) generates the light signal at maximum power (column 2 line 22-23, and column 5 line 35-36, and column 6 line 28-29), and then an attenuator (e.g., 18 in Figure 2) is used to control the power output from the attenuator to a desired level.

Caroli et al teaches that the wavelength blocker with variable-per-channel attenuation (DGEF) blocks channels not carrying signals to be added to the network and controlling an amplitude of the added signals, and minimizing amplified spontaneous emission ASE noise, and then the signal to noise ratio is increased. If the sources are running below a predetermined level, the DGEF or attenuator would not participate in the controlling, and the desired power level may not be obtained. Corio teaches that by setting the laser at maximum power, the variable attenuator can accurately (fine tune) control/adjust the power level that can be inputted into the fiber. According to the teaching/suggestion of Corio and it is also obvious that if the light source is run at minimum power, a desired power may not be obtained by the VOA since the VOA functions as an attenuating not amplifying, or the VOA may not fully participate in controlling the power: suppose the laser power can be set between -1 dBm to 5 dBm, while the laser is run at -1 dBm, the channel power that can be sent to the transmission line can only be adjusted to less than or equal to -1 dBm, and if the

transmission line needs 2 dBm channel power, the laser/VOA cannot provide that desire power; however, while the laser is run at 5 dBm, the maximum channel power that can be sent to the transmission line can reach up to 5 dBm, by using the VOA, the channel power can be adjusted/tuned to the desired power, e.g., 2 dBm. The combination of Caroli and Corio teaches that while the variable attenuator is used for control the power level of a light source, the power of the light source needs be running at maximum power so that the variable attenuator can be used to control the amplitude of the light signal to be added.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the power control scheme as taught by Corio to the system of Caroli et al and Shimomura et al so that the signal source is run at full power, and then gain equalizer/attenuator can perform the full function to conveniently and accurately control the output power to a desired level, and the desire SNR can be obtained.

3). With regard to claims 10 and 15, Caroli et al and Shimomura et al and Corio disclose all of the subject matter as applied to claims 9 and 13 above. And the combination of Caroli et al and Shimomura et al and Corio further discloses wherein the multichannel wavelength selective filter includes an n-channel demultiplexer having n outputs (e.g., Shimomura: the n-channel demultiplexer 120 in Figure 23 having n outputs), an n-channel multiplexer having n inputs (e.g., Shimomura: the n-channel multiplexer 140 in Figure 23 having n inputs), and the variable optical attenuator is arranged between each of the demultiplexer outputs and multiplexer inputs (e.g.,

Shimomura: the optical attenuator 251-254 is between each of the demultiplexer outputs and multiplexer inputs), wherein the variable attenuator on any given channel is set to block the signal on that channel if no signal on that channel is to be added onto the network, or used to control the amplitude of the added signals (Caroli: [0048]; also refer to the discussions regarding claims 9 and 13 above).

4). With regard to claim 16, Caroli et al and Shimomura et al and Corio disclose all of the subject matter as applied to claims 13 and 15 above. And Caroli et al further discloses wherein the non-signal carrying channels are blocked by attenuating to zero the outputs from the demultiplexer corresponding to those channels ([0048], the channels not carrying signal are blocked, that is, the outputs from the demultiplexer corresponding to those channels are attenuated to zero, and the ASE noise at corresponding channel position is also filtered; also refer to [0031] and [0032]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-1084. The examiner can normally be reached on Monday-Friday, 8:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Li Liu/
Examiner, Art Unit 2613
January 27, 2010